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IN THE

Supreme Court of the United States

STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and STATE OF PENNSYLVANIA, *Complainants,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, *Defendants.* STATE OF MISSOURI, STATE OF KENTUCKY, STATE OF TENNESSEE, STATE OF LOUISIANA, STATE OF MISSISSIPPI, and STATE OF ARKANSAS, *Intervening Defendants.*	No. 3, Original.
STATE OF MICHIGAN, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 4, Original.
STATE OF NEW YORK, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 5, Original.

SEMI-ANNUAL REPORT OF THE SANITARY DISTRICT OF CHICAGO OF JANUARY 1, 1938, MADE PURSUANT TO DECREE OF APRIL 21, 1930.

FRED. KLEIN CO. 24 PRINTERS CHICAGO

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NOS. 5, 8 AND 9, ORIGINAL.

OCTOBER TERM, 1937.

STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and STATE OF PENNSYLVANIA, *Complainants,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, *Defendants.* STATE OF MISSOURI, STATE OF KENTUCKY, STATE OF TENNESSEE, STATE OF LOUISIANA, STATE OF MISSISSIPPI, and STATE OF ARKANSAS, *Intervening Defendants.*	No. 5, Original.
STATE OF MICHIGAN, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 8, Original.
STATE OF NEW YORK, *Complainant,* *vs.* STATE OF ILLINOIS and THE SANITARY DISTRICT OF CHICAGO, et al., *Defendants.*	No. 9, Original.

SEMI-ANNUAL REPORT OF THE SANITARY DISTRICT OF CHICAGO OF JANUARY 1, 1938, MADE PURSUANT TO DECREE OF APRIL 21, 1930.

Pursuant to provisions of paragraph numbered 5 of the Decree in the above entitled causes, entered on April 21, 1930, the Defendant, The Sanitary District of Chicago, hereby makes its semi-annual report of January 1, 1938, as follows:

CONSTRUCTION PROGRAM.

In the semi-annual report of July 1, 1937, the status of completed work in the sewage treatment construction program involved in this case was stated to be on June 1, 1937, as follows:

TABLE 1.

COMPLETED WORK AS OF JUNE 1, 1937.

Calumet Project	$ 29,692,457.90
North Side Project	37,818,949.37
West Side Project	52,562,428.36
Southwest Side Project	14,362,272.43
West-Southwest Treatment Plant	6,451,613.53
Miscellaneous Plants and Sewers	632,961.20
Chicago River Controlling Works	680,127.04
Total	$142,200,809.83

TABLE 2.

FUTURE WORK AFTER JUNE 1, 1937.

Calumet Project	$ 2,927,000.00
North Side Project	481,000.00
West Side Project	265,000.00
Southwest Side Project	6,577,000.00
West-Southwest Treatment Plant	20,821,000.00
Chicago River Controlling Works	2,217,000.00
Total	$33,288,000.00

During the six months between the date of the last report and the present report a considerable amount of construction work has been accomplished on the Calumet, the North Side, the West Side and the Southwest Side Sewage Treatment Projects and on the Chicago River Control Works.

Calumet Project. The sewage treatment works and the sludge disposal plant have been completed and have been in service for more than a year. Minor changes and adjustments are being made, to increase the operating efficiency.

Construction of sewers in the Calumet region has been continued. Construction of the Calumet City sewer is now 99 per cent completed. Construction of the small pumping station to pump the Calumet City sewage is now 75 per cent completed. A contract for the construction of the Blue Island intercepting sewer was awarded November 4, 1937 and work was started November 19, 1937.

North Side Project. The construction of additional Final Settling Tanks, etc., for the North Side Treatment Works has been completed and the tanks have been placed in service. Plans are being prepared for certain miscellaneous improvements at the sewage treatment plant. Bids for the construction of a sewer in Niles will be received December 23, 1937, and for the construction of certain siphons under the North Shore Channel will be received December 30, 1937.

West Side Project. Construction was continued on one collateral intercepting sewer, the Halsted Street sewer which is now entirely completed and in service.

The remaining work in the West Side Project, dependent upon future financing, consists of certain collateral sewers and sewer connections in the area adjacent to the Main Drainage Channel west of Western Avenue and of facilities for the secondary (or complete) treatment of sewage at the West Side Works. Some experimental work, to determine the advantages of certain chemical processes on the effluent from the West Side Imhoff Tanks, is now being carried on. Other experiments involving short periods of aeration for this effluent are also being made.

Southwest Side Project. Construction was continued on the following contracts for the Southwest Side Intercepting Sewer, mentioned in the last semi-annual report to the Court: Contract Section 5, now 100 per cent completed; Contract Section 6, now 97 per cent completed; Contract Section 7, now 100 per cent completed; and Contract Section 9, now 80 per cent completed.

Construction was continued on the following contracts of the Upper Des Plaines Intercepting Sewer; Contract Section 2, now 100 per cent completed; and the contract for the connections to the Upper Des Plaines Sewer, now 100 per cent completed. A contract for the construction of the small pumping station for the Upper Des Plaines Sewer was awarded September 30, 1937 and the work is now 15 per cent completed. A contract for the construction of a short extension of the Upper Des Plaines sewer to the north, designated as Contract Section 8, was awarded October 21, 1937 and the work is now 12 per cent completed.

Construction was continued on the West Towns Outlet Sewer, and Contract Section 1 is now 100 per cent completed and the construction of the Outfall Structure for this sewer is now entirely completed. The construction of the Argo Sewer, from the Southwest Sewage Treatment Works to Natchez Avenue is now entirely completed.

West-Southwest Treatment Plant. Construction was continued on the following contracts mentioned in the last semi-annual report to the Court: Aeration Tanks, Operating Galleries, Final Settling Tanks,

etc., now 98 per cent completed; Electrical Work in connection with Aeration Tanks, etc., now 92 per cent completed; Erection of Machinery and Auxiliary Equipment, now 94 per cent completed; Electrical Work in the Pumping Station, now 24 per cent completed; Main Influent and Effluent Conduits, now 97 per cent completed; Pump Discharge Chamber and Plant Outfall, now 100 per cent completed; Preliminary Settling Tanks, now 92 per cent completed; Structural steel of the Incineration plant, now 90 per cent completed; Substructure of the Incineration plant, now 62 per cent completed.

The fabrication of the following equipment was continued: Steam Turbine driven Pumping Units, now 99 per cent completed; Steam Turbine driven Blower Units, now 98 per cent completed; Sludge Removal Mechanisms, now 99 per cent completed; Venturi Meters, now 99 per cent completed; Meters, Valves and Sluice Gates in connection with Effluent Conduits, now 95 per cent completed; Steam Turbine driven Generator Units, now 99 per cent completed; Transformers, now 93 per cent completed; Condensers, now 100 per cent completed; Boiler Feed Water Heaters, now 99 per cent completed; Boilers and Settings, now 28 per cent completed; Heat Exchangers, now 78 per cent completed; Preliminary Tank Mechanisms, now 59 per cent completed; Vacuum Filters, now 64 per cent completed; Sludge and coal conveying equipment; Sludge drying equipment, now 7 per cent completed; Precipitators; and Ash Handling Equipment.

A contract for the construction of the Superstructure of the Incineration Plant was awarded Septem-

ber 16, 1937. A contract for Electrical Work in connection with the Incineration Plant was awarded November 4, 1937. Bids were received for Piping and Miscellaneous Equipment in the Pump and Blower House December 16, 1937.

At the present time, 78 per cent of the 400 MGD West-Southwest Sewage Treatment Plant has been placed under contract and 53 per cent of the total plant completed.

Control Works Chicago River. The contract for construction of the Lock, Guide Walls, etc., comprising about 75 per cent of the entire Control Works project, is now approximately 85 per cent completed. The contract for Electrical Work in connection with the Lock is now 30 per cent completed. It is expected that bids will be taken for the construction of the Cross Walls connecting the lock with the shore and for the Control Gates in January, 1938.

Activated Sludge Patent Suit. The last reference to the Activated Sludge patent suit was made in the Semi-Annual Report dated January 1, 1936. Since that report the case of Edgar C. Guthard, Activated Sludge, Ltd. and Activated Sludge, Inc. vs. The Sanitary District of Chicago was argued before the United States Circuit Court of Appeals for the 7th Circuit on May 10, 1937, and on June 16, 1937, the Court upheld Judge Lindley in his interlocutory decree against the Sanitary District. Thereafter, The Sanitary District of Chicago filed a petition with the United States Supreme Court for a writ of certiorari, which was denied October 25, 1937.

Financial. The financial condition of The Sanitary District of Chicago has changed little since the time of the last semi-annual report to the Court. The local tax situation has not improved. The taxes collected and turned over to the Sanitary District since the time of the last report to the Court amount to $10,498,080.87. The bonds of the Sanitary District now outstanding amount to $131,302,390. It is expected that $6,309,500 of bonds will be redeemed January 1, 1938, leaving $124,992,890 outstanding. This is still considerably in excess of the bonding capacity of the Sanitary District, which at present amounts to $115,732,909.

Progress of Work. The total work accomplished by The Sanitary District of Chicago in the construction of sewage treatment works during the period from June 1, 1937 (the date of the summaries for the last report) to December 1, 1937 (the date of the summaries for this report) as measured by construction expenditures was, as follows:

TABLE 3.

Calumet Project	$ 934,737.16
North Side Project	84,131.24
West Side Project	107,694.84
Southwest Side Project	3,288,079.54
West-Southwest Treatment Plant	2,777,908.08
Chicago River Controlling Works	830,985.19
Total	$8,023,536.05

In addition to the amounts shown in Table 3, approximately $1,195,000 had been earned by contractors up to December 1, 1937, on the various items of construction work, but had not been paid, being retained by the Sanitary District as reserved percentage until the final completion of the contracts.

By adding the various items indicated in Table 3 to corresponding items in Table 1, the completed portion of the sewage treatment construction program on December 1, 1937, was as follows:

TABLE 4.

COMPLETED WORK AS OF DECEMBER 1, 1937.

Calumet Project	$ 30,627,195.06
North Side Project	37,903,080.61
West Side Project	52,670,123.20
Southwest Side Project	17,650,351.97
West-Southwest Treatment Plant	9,229,521.61
Miscellaneous Plants and Sewers	632,961.20
Chicago River Controlling Works	1,511,112.23
Total	$150,224,345.88

The estimated cost of future essential sewage treatment construction, as of December 1, 1937, is as follows:

TABLE 5.

FUTURE WORK AFTER DECEMBER 1, 1937.

Calumet Project	$ 1,889,000
North Side Project	685,000
West Side Project	205,000
Southwest Side Project	3,484,000
West-Southwest Treatment Plant	19,265,000
Chicago River Controlling Works	1,380,000
Total	$26,908,000

Funds remaining unexpended from the amounts obtained under the agreement of September 21, 1935 with the Federal Emergency Administration of Public Works to the extent of $11,158,000 are available for this future work. This leaves essential work to the extent of $15,750,000 to be financed from other sources. The Sanitary District will apparently be able to finance work to the extent of $1,275,000 now, leaving work estimated at $14,475,000 for which no resources are presently available. The specific items estimated at $14,475,000 are secondary treatment of

West Side sewage $12,650,000, additional sewers for 100 per cent collection of sewage on the North and West Side areas $300,000, improvements in Calumet Project $130,000, additions to North Side plant $175,000, Argo sewer $870,000, connections to 39th Street conduit and changes at 39th Street pumping station $220,000 and a contingent expenditure of $130,000 in connection with Chicago River control works.

SEWAGE TREATMENT.

The population of The Sanitary District of Chicago, as of January 1, 1938, is about 4,587,000, according to estimates made from the figures of the 1930 census. The industrial wastes in the Sanitary District are assumed to be equivalent to the sewage of 1,805,000 additional persons. Hence, the total population and industrial wastes equivalent amount to 6,392,000. This figure includes the Corn Products wastes, which would have been equivalent to the sewage of 393,000 persons if no recovery had been accomplished. These wastes have been greatly reduced, as a result of certain experimental work initiated by the Sanitary District.

The January 1, 1938 total population, and industrial waste equivalent, as above indicated, are estimated as 6,392,000. Up to date, the Sanitary District has assumed that so-called complete sewage treatment could produce an annual average of 85 per cent purification. Hence, so-called complete treatment for the total January 1, 1938 population and industrial wastes equivalent would equal the 100 per cent treatment of the sewage of 5,433,000, which is 85 per cent of 6,392,000.

The expenditures for sewage treatment have been indicated in Tables 1, 3, and 4. The amounts of actual sewage treatment in operation on June 25, 1937 (as of the time of the last report to the Supreme Court) and at the present time are shown in Tables 6 and 7, following:

TABLE 6.

ACTUAL SEWAGE TREATMENT IN OPERATION AS OF JUNE 25, 1937.

Treatment Works	Population Equivalent	Percentage Treatment	Treatment 100 Per Cent Basis
Calumet	326,000	85	277,000
North Side	1,235,000	85	1,049,000
West Side (Sedimentation)	1,622,000	33⅓	541,000
Miscellaneous (Morton Grove, Glenview, Northbrook)	8,000	85	7,000
Corn Products (Reduction)	415,000		376,000
Total	3,606,000		2,244,000

TABLE 7.

ACTUAL SEWAGE TREATMENT IN OPERATION AS OF DECEMBER 24, 1937.

Treatment Works	Population Equivalent	Percentage Treatment	Treatment 100 Per Cent Basis
Calumet	335,000	85	285,000
North Side	1,251,000	85	1,063,000
West Side (Sedimentation)	1,633,000	33⅓	544,000
Miscellaneous (Morton Grove, Glenview, Northbrook)	8,000	85	7,000
Corn Products (Reduction)	393,000		359,000
Total	3,620,000		2,258,000

The extent of the operation of sewage treatment plants at the present time is equal to the 100 per cent treatment of the sewage of 2,258,000 out of 5,433,000 persons, which would be the present possible 100 per cent treatment if the sewage of the total population and industrial wastes equivalent of 6,392,000 were being treated. This indicates the actual treatment of approximately 41.6 per cent of the total sewage within the Sanitary District, although considerable additional construction work has been performed during this period, for which no credit will be taken in this percentage until the works are completed and put in operation.

DIVERSION OF WATER.

The net diversion of water from Lake Michigan, during the calendar year 1936 averaged 4,862 cubic feet per second. The domestic pumpage of the Chicago metropolitan area during this period averaged 1,712 cubic feet per second; the inflow from the Des Plaines River averaged 33 cubic feet per second; and the total flow from the Main Channel at Lockport averaged 6,607 cubic feet per second.

Diversion of water from Lake Michigan by The Sanitary District of Chicago since July 1, 1930, has been made in accordance with a Permit from the Secretary of War, dated June 26, 1930, which authorized the diversion of water as specified in the Decree of the Supreme Court, handed down April 21, 1930. This limited the net diversion to an annual average of not more than 6,500 cubic feet per second up to December 31, 1935, and thereafter limits the net diversion to an annual average of not more than 5,000 cubic feet per second up to December 31, 1938. The average monthly diversion, as made under this Permit from January 1 to December 20, 1937, is indicated in the table following:

Month 1937	Total Flow from Main Channel at Lockport C.F.S.	Inflow from Des Plaines River C.F.S.	Domestic Pumpage Chicago Metropolitan Area C.F.S.	Net Diversion from Lake Michigan C.F.S.
January	6348	88	1602	4658
February	5629	32	1635	3962
March	5462	30	1613	3819
April	6350	41	1587	4722
May	5843	31	1586	4226
June	6746	25	1629	5092
July	7313	0	1835	5478
August	7681	0	1895	5786
September ...	6925	0	1772	5153
October	7175	0	1673	5502
November ...	7392	0	1571	5821
Dec. 1 to 20..	7300	0	1550	5750
Average	6680	21	1662	4997

All of which is respectfully submitted,

THE SANITARY DISTRICT OF CHICAGO,

By ROSS A. WOODHULL,
President.

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Chief Engineer.

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Attest:
JAMES J. SULLIVAN,
Clerk.